Quick Start Guide

SSW04

- 5 to 30HP (16 to 85A) 230V
- 10 to 75HP (16 to 85A) 460V
- 15 to 75HP (16 to 85A) 575V

SSW 04

Power Connections and Keypad Operation:

The SSW04 Quick Start Guide is a supplement to help get the SSW04 started quickly using the most common installation and configuration options. This SSW04 Quick Start Guide is not meant to replace the SSW04 User's Manual. For detailed instructions, safety precautions, proper mounting, installation, configuration, and operation please refer to the SSW04 User's Guide. **Warning:** Only qualified personnel should plan or implement the installation, start-up, operation and maintenance of this equipment. Personnel must read the entire SSW04 User's Guide before attempting to install, operate or troubleshoot the SSW04.

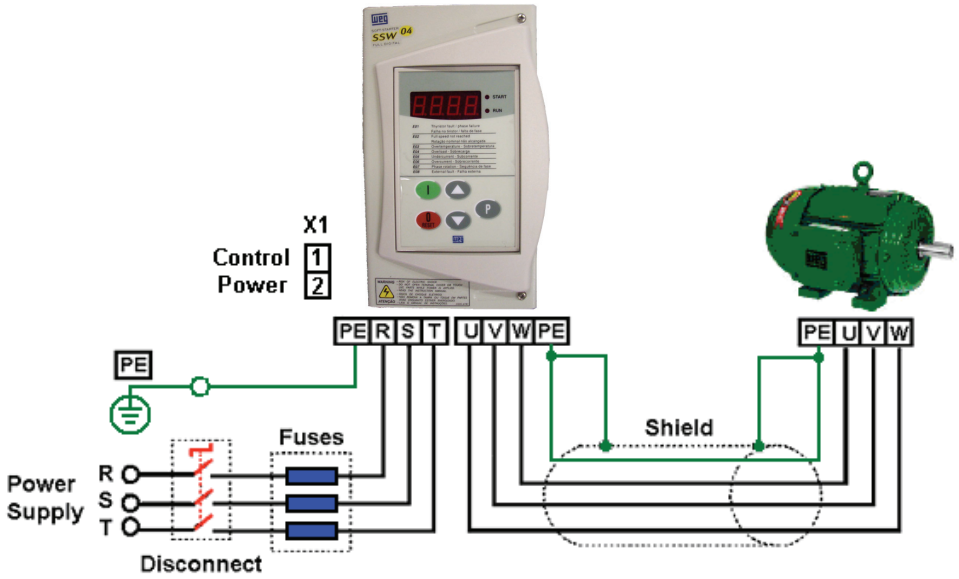

Figure 1 *- Power and Grounding Connections*

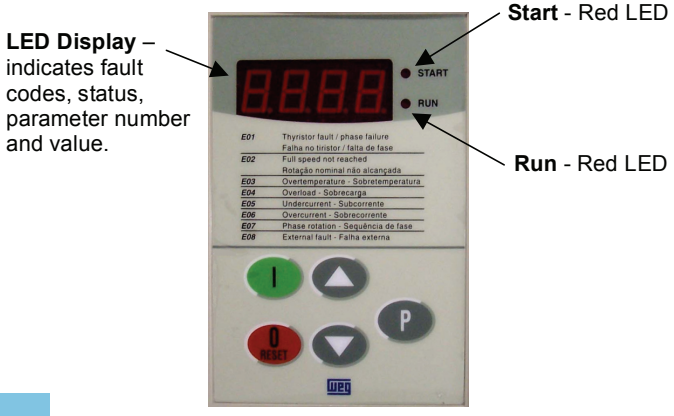

Figure 2 *– Keypad Operation*

Key	Description
P	Switches the display between parameter number and content.
▲	Increases Parameter number/content.
▼	Decreases Parameter number/content.
I	Starts (Enables) the motor.
0 RESET	Stops (Disables) the motor, and resets the Soft Starter after a fault has occurred.

Display	Description
rdy	Soft Starter is ready to be enabled
Pup	Loading pump control parameters
EEP	Loading "Default" values
on	Function enabled
oFF	Function disabled

Basic Wiring:

1. Mount the SSW04 to a flat vertical surface.
2. Connect the three-phase incoming power leads to the R, S, and T connections on the power terminal and connect the GROUND lead to PE on the chassis (Refer to Figure 1). Connect the motor leads to the U, V, and W connections on the power terminal and connect the GROUND lead to PE on the chassis (Refer to Figure 1).
   Note: Only three-phase AC motors can be used.
3. Connect control power (110Vac) hot and neutral leads to pins 1 & 2 of the X1 connector respectively.
4. Apply Control Power followed by Input Power. The soft starter will run self-diagnostics and if no problems are found it will display “rdy” on the LED display.

Minimum Parameters to Set:

P21 – Motor Current Setting - Factory default position is “OFF” so there is no motor overload protection. To protect the motor from overload, obtain the full load amperage (FLA) off the motor and soft-starter name plates, and using the following formula, calculate the percentage of current that the motor will draw from the soft-starter.

- **I_N of the soft-starter = 170A**
- **I_N of the motor = 140A**
- **I_N of the motor / I_N of the switch = 140A / 170A = 0.823**
- **P21 = 82.3%**

P25 – Thermal Class of Overload Protection - Set to factory default of 30 if not specified on the motor name plate.

P26 – Motor Service Factor – obtain from motor name plate.

Notes: (1) To change the value of parameters set parameter **P000=ON.**
(2) Soft Starters are shipped with factory default values. If parameters have been changed it is advisable to reset to factory default values prior to a new installation by setting **P46=ON.**
(3) These are the minimum parameters for a perfect adaptation between soft starter and motor. For a complete description of Parameters and Error codes refer to Chapters 6 and 7 in the SSW04 User’s Guide.

Keypad Start/Stop Operation (Local Mode):

Action	LED Display	Description
After power-up, the display shows the following message.		Soft Starter powered-up.
Press “Start”		Motor begins to accelerate. Motor current (P72) = 200%
		When end of Acceleration ramp (P02) is reached the Motor Current (P72) = 100%
Press “Stop”		By default, motor coasts to rest. For a decelerated stop, program P04 for desired deceleration time.
		Soft Starter is turned off in “rdY” condition.

Start/Run LED Symbols: ● LED ON ◒ LED Flashing ○ LED OFF

Start-up by Voltage Ramp

2 Wire Start/Stop (Remote Mode):

Parameters:

1. Set P61=OFF to allow control from Digital Inputs instead of keypad.
2. By default DI1 is “2 Wire Start/Stop” and can not be changed directly.
3. Confirm P53, P54, and P55 are set to default values (Figure 3).

Control Wiring: Verify there is a jumper between X2-3 and X2-5 or an external fault (E08) will occur. The jumper can be eliminated if DI3 is set to “No Function” (P54=OFF). Start/Stop switch is N.O. (normally open) and is connected as shown in Figure 3.

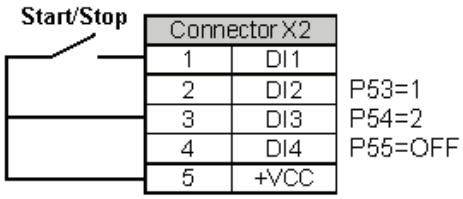

Figure 3 *– 2 Wire Start/Stop*

3 Wire Start/Stop (Remote Mode):

Parameters:

1. Set P61=OFF to allow control from Digital Inputs.
2. Set DI2 to “3 Wire Control” (P53=4). This sets DI2 as the “Stop” input and DI1 as the “Start” input.
3. Confirm P53, P54, and P55 are set to default values (Figure 4).

Control Wiring: Verify there is a jumper between X2-3 and X2-5 or an external fault (E08) will occur. The jumper can be eliminated if DI3 is set to “No Function” (P54=OFF). “Start” and “Stop” are momentary push button switches and are connected as shown in Figure 4. “Start” is a N.O. (normally open) contact and “Stop” is a N.C. (normally closed) contact.

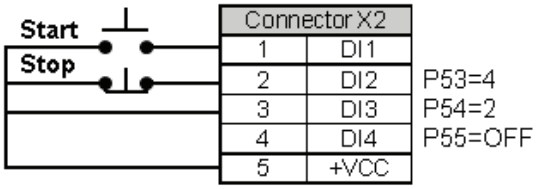

Figure 4 *- 3 Wire Start/Stop*

Remote Start/Stop Operation with Parameter Setup:

Action	LED Display	Description
After power-up, the display shows the following message.		Soft Starter powered-up and ready to be programmed.
Press		Parameter mode is entered.
Press and scroll to parameter P00.		Permits programming of parameters.
Press		Parameter Value is displayed.

Press ▲		Setting P00=ON allows parameters to be programmed.
Press P		Parameter value is stored.
Press ▼ and scroll to parameter P61.		Parameter P61 determines whether commands are accepted through keypad/serial port or through the digital inputs.
Press P		Parameter Value is displayed.
Press ▼		Setting Parameter P61 to “OFF” allows commands to be accepted through digital inputs instead of keypad/serial port.
Press P		Parameter value is stored.
Press ▲ and scroll to parameter P72		Indicates percentage of output current.
Press P		Parameter Value is displayed.
A. Close the Start/Stop switch at DI1 if 2 Wire Control. **B.** Push the Start switch at DI1 if 3 Wire Control.		Motor starts and P72 indicates 200% output current at start up.
		After acceleration time (P02) has been reached P72 indicates 100% output current.
A. Open Start/Stop switch at DI1 if 2 Wire Control. **B.** Push the Stop switch at DI2 if 3 Wire Control.		Motor coast to rest if P04 is set to “OFF”. For a decelerated stop, program P04 for desired deceleration time.
		Soft Starter is turned off in “RDY” condition.

Start/Run LED Symbols: ● LED ON ◒ LED Flashing ○ LED OFF

Fault Codes:

When a fault is detected, the soft starter is disabled and the Fault Code is displayed (example E03). To restart the soft starter after a fault has occurred, the soft starter must be reset. Resetting the soft starter can be done by disconnecting and reapplying AC power (power-on reset), by pressing the “O/RESET” key (manual reset), automatic reset, or via digital inputs. For details on Reset and a full list and description of Fault Codes please read Chapter 7 in the SSW04 User’s Guide.

Credit Limiting for Loads with High or Constant Starting Torque

P11 – Current Limiting During Starting

- P11 sets the maximum current value that will be supplied to the motor (load) during acceleration.
- The current limitation is used for loads with high or constant starting torque.
- The current limitation must be set at a level that permits the motor to accelerate otherwise the motor will not start.

P11- Calculation example for limiting the current to 2.5 x I_N of the motor:

- **I_N of the switch = 60A**
- **I_N of the motor = 52A**

- **I_{LIM} = 250% of the I_N of the motor**
- **2.5x 52A =130A**

- **130A / I_N of the switch = 130A / 60A = 2.17 x I_N of the switch**

- **P11 = 217% of the I_N of the switch = 2.5x I_N of the motor**

Notes: (1) If the full voltage is not reached at the end of the acceleration ramp time (P02), the error E02 will be displayed and the motor will be disabled. **(2)** Current Limiting is not active when the Voltage/Kick pulse (P41) is enabled during start. **(3)** Please refer to Chapter 6 in the SSW04 User's Guide for detailed information on Current Limiting during starting.

Soft Starters

SSW04

Technical Data

Power Supply	Voltage	Model D: 220 / 230 / 240 / 380 / 400 / 415 / 440 V (+ 10 % , - 15 %)	
		Model G: 460 / 480 / 575 V (+ 10 % , - 15 %)	
	Frequency	50 / 60 Hz +/- 5 Hz (45 ... 65 Hz)	
	Control Voltage	115VAC	
Enclosure	Metallic Cabinet	IP 20	
	Color	Cover: Opaque Gray, Cabinet: Opaque Blue	
Control	Method	Motor Voltage Variation	
	Power Supply	Switched Mode Power Supply	
	CPU	16 Bit Microprocessor	
Starting Duty Cycle (10 Starts / Hr)		300 % (3 x Rated Current) for 20 sec (10 Starts/hour)	
Inputs	Digital	4 x 24vDC Programmable Isolated Inputs	
Outputs	Relay	2 programmable Outputs: 250 V / 1 A Form A Contact (NO)	
	Analog	1 Output (Reversing (NO + NC) : 250 V / 1 A – Fault Indication	
Communication	Serial Interface	RS-232	
Safety	Protections	Power supply phase loss	Programming Error
		Motor Phase Loss	Motor locked rotor
		Motor Overload - i2t	CPU Error (Watchdog)
		External Fault	Motor Immediate Over Current
		Phase Sequence	Motor Over Temperature (via Thermistor input)
		Motor Immediate Under Current	Self Diagnosis Error
		Thyristor Fault	Thyristor's / Heatsink Over Temperature
		Serial Communication Error	
Functions / Features	Standard	Built-in Operator Interface (keypad) Detachable – 7 Segment LED Display	
		Programming Enabling Password	
		Fault Auto-Diagnosis	
		PUMP CONTROL Feature (Water Hammer Protection for Pumps)	
		ENERGY SAVING Feature	
		BY-PASS Relay	
		FWD / REV Feature via Digital Input (Needs External Contactor)	
		RS-232 Serial Interface	
		Motor PTC thermistor input	
		Programmable Pedestal Voltage	25 … 90% of Rated Voltage
		Programmable Acceleration Ramp	1 ... 240 seconds
		Programmable Deceleration Ramp	OFF, 2 ... 240 seconds
		Programmable Step Down Voltage for Deceleration	100 ... 40 % of Rated Voltage
		Programmable Starting Current Limit	OFF, 150 ... 500 % of Rated Current
		Programmable Immediate Motor Over Current Level	105 ... 200 % of Rated Current
		Programmable Immediate Over Current Time	OFF, 1 ... 20 seconds
		Programmable Immediate Motor Under Current Level	25 ... 95 % of Rated Current
		Programmable Immediate Under Current Time	OFF, 1 ... 30 seconds
		Kick Start	Level : 70 ... 90 % of Rated Voltage
			Duration: 0.1 ... 2 seconds
		DC Braking (DC Current Injection)	Level : 30 ... 50 % of Rated Voltage
			Duration: 1 ... 10 seconds
		Programmable Motor Overload Protection	OFF, 50 ... 120 % of Rated Current
		JOG Function	25 ... 50 % of Rated Voltage
		Programmable Fault Auto Reset	OFF, 10 ... 600 seconds
		Programmable Motor Thermal Memory Auto-Reset	OFF, 1 ... 600 seconds
		Motor Thermal Overload Protection Class	5, 10, 15, 20, 25 and 30
		Motor Service Factor	0.80 ... 1.50
		Programmable Line Voltage	220 ... 440 V and 460 ... 575 V
	Optional	Remote Operator Interface (LED's)	
Operator Interface (Keypad)	Programming / Commands	Start, Stop / Reset and Programming	
		Increment and Decrement Parameters Content	
	Display Readings	Output Current (Motor) – [A]	Output Voltage – [0...100 % Rated Voltage]
		Output Current (Motor) – [% of Rated]	Motor Output Factor – [0.00 ... 0.99]
		Load Active Power – [kW]	4 Last Faults Back-up
		Load Apparent Power – [kVA]	Soft Starter Software Version
		Thermal Protection Status – [0 ... 250 %]	
Ambient	Temperature	0 ... 40 °C (32 ... 104 °F)	Standard Operation at Rated Current
		40 ... 55 °C (104 ... 131 °F)	With Output Current Derating
	Humidity	0 ... 90 %, Non Condensing	
	Altitude	0 ... 1000 m (3,300 ft) Standard Operation at Rated Current	
		Up to 4000 m (13,200 ft) – With Current Derating (1%/100 m(328 ft) above 1000 m (13,200 ft))	
Finishing	Color	Cover: Light Grey RAL 7032	Cabinet: Dark Grey RAL 7022
Conformities	Safety	UL 508 Standard – Industrial Control Equipment	
	Low Voltage	EN 60947-4-2 Standard ; LVD 73 / 23 / EEC – Low Voltage Directive	
	EMC	EMC Directive 89 / 336 / EEC – Industrial Environment With Additional Filter	
Certifications	UL(USA)/cUL(Canada)	Underwriters Laboratories Inc. – USA	
	CE (Europe)	Certified by ITS – UK	

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